

PELAGIC AMPHIPODA.

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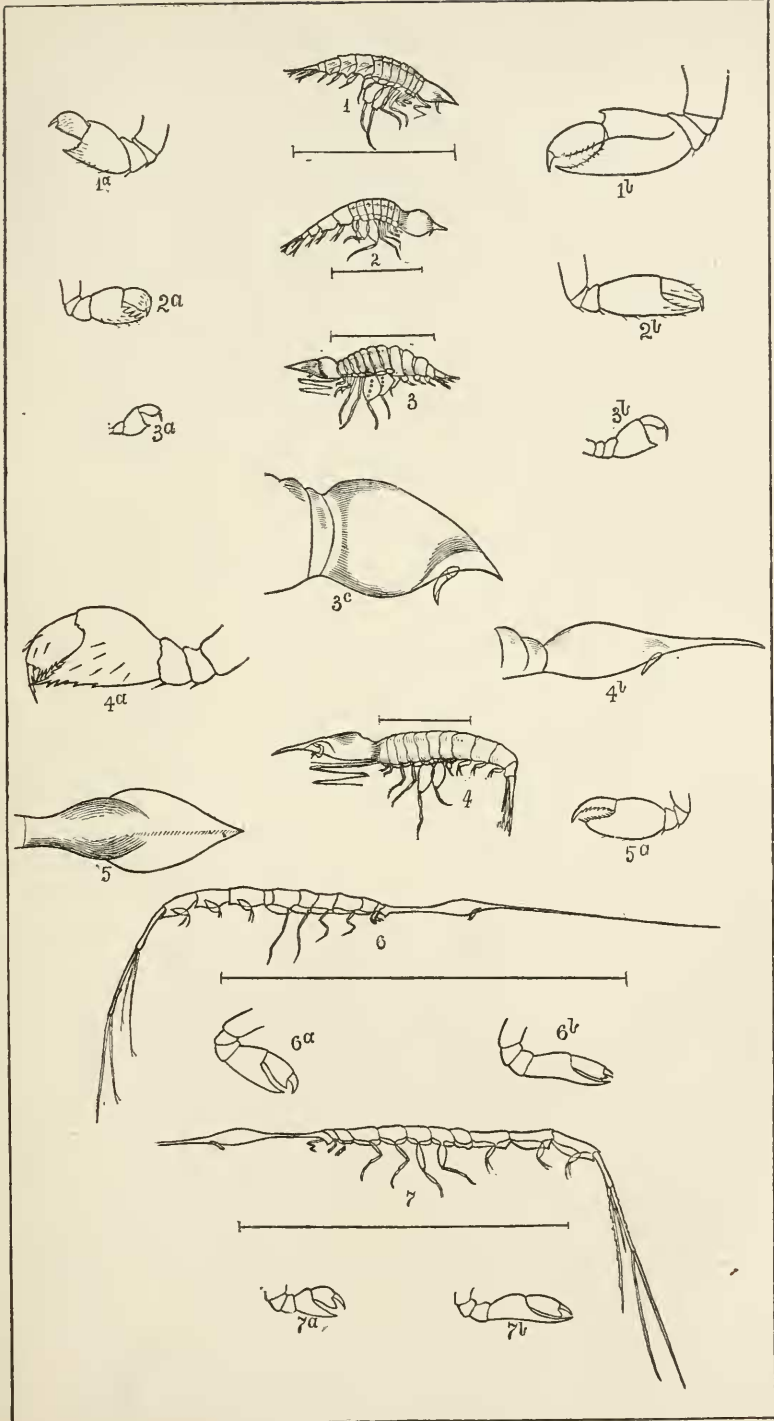
The crustaceans to be discussed in this and subsequent papers "are oceanic species, and are mostly found remote from the land." They belong to Dana's subtribe *Hyperidea*, and to Bate's division *Hyperina*.

There is a remarkable contrast between the two great divisions of Amphipoda—the *Gammaridea* and the *Hyperidea*. The former are generally found along shore, in deeper water near the bottom, or on floating material, and there is a great resemblance running through all the species; while the latter swim free in the mid-ocean, and there is the greatest diversity of characters among them.

The collection, which has been placed in my hands for identification, is probably the largest which has ever been gathered together by a single individual. It was collected by Surgeon William H. Jones, U. S. Navy, and his work embraces a period of about four years. It comes from nearly the entire Pacific Ocean, north and south of the equator, except the extreme high latitudes. A portion of it now enriches the Academy's collection, and the remainder has been retained by the collector.

The specimens were mostly taken with a towing-net at night, which is "about the only time when surface dredging can be carried on with any prospect of success." (I quote from the notes furnished by Dr. Jones.) "Those captured in daytime were taken under special circumstances, such as discoloration of the water, the presence on the surface of objects visible to the naked eye, or when passing through schools of fish, *Velella*, *Porpita*, or *Physalia*, when some rare forms would be occasionally met with in the dredge or net.

"The dredge was frequently tried in daytime when the speed of the vessel would permit, and towed for several hours at various depths, ranging from the surface to forty fathoms, without securing a specimen beyond a few that have an almost universal distribution, while, if the dredge was put over an hour or two afterwards, when it had become dark, they would be taken in great numbers. The state of the weather and sea, and the character of



the night have great influence in effecting their approach to the surface or within reach of the dredge. A smooth sea, a dark night, especially if cloudy or squally, or warm and sultry, seems to be their favorite time for approaching the surface in the greatest numbers; while, on the other hand, a moonlight night, or high winds, and a rough and heavy sea, keep them from coming so near the surface.

"Usually they approach the surface about twilight, or within half an hour after dark, and remain on or near the surface for two or three hours, although occasionally they remain much later, being apparently influenced by the darkness of the night and state of the weather."

I attach much importance to these notes, as they give the first information we have had of the habits of these little animals. I have noticed myself that a great many of them, when alive, have the property of phosphorescence, and it has occurred to me may it not be this which causes them to shun the light? They carry their own light about with them.

OXYCEPHALIDÆ.

Body elongate, narrow. Head lengthened in the direction of the axis of the body, and produced anteriorly beyond the superior antennæ in the form of a pointed rostrum. Eyes occupying the greater portion of the head, posterior to the superior antennæ. Antennæ on the inferior surface of the head; the superior (anterior) pair short; the inferior (posterior) long, and folded upon itself four times, and concealed in a groove on the under surface of the head. Mandibular appendage long. The inferior antennæ and mandibular appendage are absent in the female.¹ First and second pairs of the thoracic legs small, and chelately developed. The basal joint of the three posterior pairs of thoracic legs broadly dilated, except in some species of *Rhabdosoma*. The last pair of legs smaller than the preceding; either rudimentary developed or obsolete. Caudal appendages lanceolate, or linear; biramous. Telson broadly triangular, or linear.

¹ Claus classifies the *Oxycephalidæ* along with the *Phronimidæ* in his family *Phronimides*, and states that the mandibular palpus is absent, which is an error. Though absent in both sexes of the *Phronimidæ*, it is present in the male of the *Oxycephalidæ*.

OXYCEPHALUS, Edwards.

Body moderately long, robust. Head narrow, produced anteriorly in a broad, triangular rostrum, short, grooved below; a constriction of the head may, or may not, exist behind the eyes and in front of the first thoracic segment. The superior antennæ three-jointed, the middle joint short; inferior antennæ five-jointed, joints subequal, except the last, which is short. Mandibular appendage three-jointed. The first and second pairs of thoracic legs short, clawed; the third and fourth simple; the last three pairs with the basal joint broadly dilated; the last pair diminutive or rudimentary; the extremity of the sixth pair—articulating with the broad basal joint—finely serrated along the anterior margin. The sixth abdominal segment broad, not elongated. The caudal appendages short, broadly lanceolate. Telson broadly triangular.

Oxycephalus tuberculatus, Sp. Bate. Fig. 1, 1a, 1b.

Oxycephalus tuberculatus, Sp. Bate, Catalogue Amphi. Crust., 1864, p. 343, pl. 54, fig. 5.—Streets, Bulletin of the National Museum, Washington, 1871, p. 136.

Head long, almost equal to the first five segments of the thorax, broad, deeper posteriorly than anteriorly, superior surface straight, on a level with the dorsum of the thorax, inferior margin convex, sloping upward anteriorly; rostrum short, somewhat more than half the length of the head, broad, triangular, acute, lateral edges serrated, a high longitudinal ridge along the middle above, extending backward on the head. Superior antennæ with peduncle broad, three-jointed, the second joint the shortest, the third longer than the first and second combined; a few auditory hairs at the apex; flagellum bi- or tri-articulate, short, slender, bent forward. Inferior antennæ with the first joint enlarged at its distal extremity, the second the longest, the fourth and fifth together slightly shorter than the third, the fifth short; the whole antenna folded upon itself four times, and concealed in a groove on the under surface of the head. The mandibular palpus long, about the same length as the first joint of the inferior antenna, the second and third joints short, subequal.

Three longitudinal ridges along the dorsum of the thorax, one in the median line of the body, and one on either side of the median row, with an anterior and posterior tubercle on each segment of the thorax; the ridges are interrupted at the articulations of

the segments, commencing and terminating in the tubercles on each segment; similar ridges descend from the tubercles along the front and after margins of the segments; along the side of the thorax are a number of short ridges, irregularly placed. On the side of each of the three anterior abdominal segments is an oblique ridge, forked posteriorly; the median dorsal ridge of the thorax gradually disappears on the abdominal segments. The first and second pairs of thoracic legs short, perfectly chelate; the first shorter than the second, the fourth joint short, produced antero-inferiorly, but not to the apex of the fifth joint, acute, spinous on the lower and anterior edges, serrated on the latter, antero-superior angle acute, projecting forward; the fifth joint articulating with the fourth below the superior angle, convex above, lower edge straight and serrated, spinous; dactylus short, slightly longer than the anterior edge of the fifth joint. The hand of the second pair more elongate, the fourth joint produced antero-inferiorly to the apex of the fifth joint, and the tip slightly curved upward; the fifth joint oblong; in other respects resembles the first pair. Third and fourth pairs of legs subequal, simple, with a few hairs, or spines, along the posterior edge; the fifth pair the longest, with the hairs arranged along the anterior edge; the anterior edge of the sixth pair pectinated, fine teeth in the intervals between the coarser ones; basal joint of the last three pairs of legs broadly dilated, the sixth shorter than the fifth, but broader, margins finely serrated; the seventh pair of thoracic legs diminutive, the broad basal joint narrowing distally, the remaining portion of the leg shorter than the first joint. In the smaller specimens the length of the seventh pair about equals the length of the basal joint of the preceding pair, but in the larger specimens it is somewhat longer.

The inferior margin of the first three abdominal segments furnished with two sharp, prominent spines directed downward and backward, and separated by a deep notch; one is situated on the middle of the inferior margin, and the other projects from the posterior angle. The first and third pairs of caudal appendages extending backward about the same distance, and reaching to the extremity of the telson; the second pair terminating opposite the commencement of the rami of the last pair; rami serrated, long. Sixth abdominal segment longer than broad. Telson broad, triangular, serrated.

No. examined.	Localities.		Temp. water	Temp. air.	Lengths.	Sex.
1	Lat. 32° 23' S.	Lo. g. 98° 30' W.	64° F.	68° F.	28 mm.	♂
2	" 28 47 N.	" 124 29 "	63 "	62 "	28 "	♀
3	" " " "	" " " "	" "	" "	20 "	♀
4	" 35 25 "	" 142 53 "	61 "	59 "	25 "	♀
5	" " " "	" " " "	" "	" "	15 "	♀
6	" 5 00 "	" 128 00 "	....	....	10 "	♀
7	" 25 22 "	" 133 12 "	67 "	67 "	12 "	♂ (young)
8	" 25 13 "	" 143 15 "	....	....	14 "	♀

The males of this species are smaller than the females, and there is a slight difference in the shape of the superior antennæ. The peduncle is more robust, and the apex of the last joint is produced; the anterior aspect of the produced portion slopes backward forming an obtuse angle with the main portion of the joint, and is sparsely covered with hairs.

Oxycephalus bulbosus, n. sp. Fig. 2, 2a, 2b.

Female.—Body compressed; head one-fourth of the total length, the portion containing the eyes rounded in profile, equally convex above and below, compressed, the neck portion constricted, but not narrower than the first segment of the thorax; the rostrum one-third the length of the head (its own length included), depressed, narrower than the head when looked at from above, slightly constricted in the situation of the superior antennæ, duck-bill shape, acute, ridged along the median line above. Superior antennæ slender; peduncle with the first and last joints subequal, the second short, the third joint with hairs along the anterior margin; flagellum two-jointed. Three slightly elevated ridges running the length of the thorax—one in the median line, and one on either side of it—ridges not continuous, but interrupted at the articulations of the segments. The first and second pairs of thoracic legs short, perfectly chelate; the first smaller than the second, stouter, the fourth joint produced antero-inferiorly to the apex of the fifth joint, spinous; dactylus short. The third and fourth pairs of legs subequal; the fifth the longest, its basal joint oval; the sixth shorter than the one preceding, but its basal joint broader, remaining joints pectinated as in *O. tuberculatus*; the last pair shorter than the sixth, all its joints well developed, to-

gether longer than the basal joint of the sixth pair. The postero-inferior angle of the anterior abdominal segments acutely produced; in front of the posterior angle on the inferior margin a broad notch, no spine on the inferior border. The first and last pairs of caudal appendages and telson extending about the same distance backward; the second pair terminating opposite the commencement of the last pair and the commencement of the rami of the first pair. The sixth segment of the abdomen longer than broad. Telson broad, triangular at apex.

No. exAm.	Localities.	Temp. water.	Temp. air.	Length.	Sex.
1	Lat. 28°00' N. Long. 140°00' W.	70° F.	69° F.	17 mm.	♀
2	" 27 00 N. " 140 00 W.	70 "	69 "	13 "	♀
3	" 35 45 N. " 144 25 W.	62 "	58 "	14 "	♀

The affinities of this species are with *Orycephalus tuberculatus*, but is very readily distinguished by the bulbous shape of the head and by the absence of the spine on the inferior margin of the three anterior abdominal segments. There are no males in the collection.

Oxycephalus scleroticus, n. sp. Fig. 3, 3a, 3b, 3c.

Male.—Animal with the tegumentary covering hard and resisting. Head as long as the first six segments of the thorax; the portion containing the eyes rounded and shorter than the part anterior to it, compressed, wedge-shaped, with the broad end of the wedge posterior, constricted in front, and notched behind and above at its articulation with the thorax, inferior surface convex, superior surface rounded and sloping downward; rostrum broad, triangular, depressed towards the end, acute, elevated in the median line, in the smaller specimens the point of the rostrum was deflexed; a broad deep concavity beneath the rostrum for the reception of the superior antennæ; the groove for the inferior antennæ and mandibular palpi long and narrow. Superior antennæ bowed in the form of a half-circle, and springing from the posterior extremity of a lengthened elevation on the under surface of the rostrum, the convex margin densely hairy, the apex of the concave border produced at nearly a right angle with the rest of the joint; peduncle with the middle joint short; flagellum three-jointed and articulating with the base of the produced apex

of the last joint of the peduncle. Inferior antennæ when folded reaching nearly to the extremity of the rostrum, first four joints long and subequal, the fifth short. Mandibular palpus long, first joint long, the last two short and subequal. The thorax elevated along the median line into a broad, rounded ridge, with the sides sloping down from the summit; the ridge appearing somewhat nodulated; a row of nodules along the side above the epimerals; on the fifth epimeral a prominent spine, directed backward; the segments of the thorax decreasing posteriorly, each segment bulging, not overriding its fellow; the whole surface of the body finely granulated. First and second pairs of thoracic legs short, chelate; the first smaller than the second, with the fourth joint broad, produced, apex acute, spinous: the second pair with fourth joint more produced than in the first, the anterior margin of the joint nearly straight; the fifth joint as long as the anterior margin of the fourth, spinous below; claw long, acute. The last three pairs of thoracic legs with the basal joint broadly dilated, and with a series of four pits along the median line of the outer surface of each joint, their posterior edge broadly produced backward near the middle; the basal joint of the sixth pair the broadest; that of the last pair small, its distal margin broad, the entire leg shorter than the first joint of the preceding pair. The three anterior abdominal segments with the postero-inferior angle produced, acute, inferior edge straight; the fourth segment small; the fifth and sixth consolidated, and together as long as the telson. Telson triangular, broad, projecting but slightly beyond the extremities of the caudal appendages. The first and third pairs of caudal appendages reaching backward nearly the same distance; the last pair very short, the rami equalling the length of the base; the second pair slender, and terminating opposite the commencement of the rami of the last pair; rami lanceolate.

No. exam.	Localities.	Temp. water.	Temp. air.	Length.	Sex.
1	Lat. 26° 13' N. Long. 143° 15' W.	71° F.	67° F.	15 mm.	♂
2	" 25 13 N. " 143 15 W.	.....	.....	10 "	♂
3	" " " N. " " " W.	.....	.....	10 "	♂
4	" 25 50 N. " 132 45 W.	68° F.	68° F.	10 "	♀

The female of this species is more robust than the male. The head is deeper and broader, more rounded above and below, the notch posterior shallower; the rostrum shorter and narrower. Superior antennæ straight, or slightly curved, slender, not produced at the apex of the third joint of the peduncle. In the one specimen of this sex in the collection the spine on the fifth epimeral was absent.

The figure was taken from the largest specimen in the collection. The head is longer, and the constricted portion behind is broader than in the two other male specimens. In the latter the tip of the rostrum is somewhat deflexed.

LEPTOCOTIS, Streets.

Body long and slender. Head produced anteriorly to the superior antennæ in a long, slender rostrum, constricted posteriorly at its articulation with the thorax, the constricted portion short. Superior antennæ short, three-jointed, curved in the male, and straight in the female; inferior antennæ five-jointed, joints subequal, excepting the last which is short. Mandibular appendage three-jointed. First and second pairs of thoracic legs short, chelate; the third and fourth simple; the last three pairs with the basal joint dilated; the last pair diminutive. The sixth abdominal segment (the fifth and sixth fused) elongated. The caudal appendages long, linear. Telson long, triangular at apex.

This genus occupies an intermediate position, showing the transition from the short *Oxycephalus* into the excessively elongated form of the *Rhabdosoma*. Its affiliations are with both.

Leptocotis spinifera, Streets. Fig. 4, 4a, 4b.

Leptocotis spinifera, Streets, Bulletin of the U. S. National Museum, Washington, 1877, p. 137.

Male.—Head long, excluding the rostrum, as long as the thorax, deeper posteriorly than anteriorly, gradually narrowing above and below to the rostrum, superior surface abruptly constricted behind, the neck on a level with the dorsum of the thorax, the rest of the superior surface elevated above the dorsum of the thorax, straight, slightly arched over the superior antennæ, inferior margin convex, the front hollowed out below on either side into fossæ for the superior antennæ; rostrum slightly more than one-third the length of the head (including its own length), slender, acute, slightly arched. Superior antennæ sickle-shaped, the first and second joints

short, forming the handle of the sickle, the second joint shorter than the first, both together shorter than the broad, curved, terminal joint of the peduncle, margins of the last joint densely hairy, apex produced into a long, stout process, at right angle with the rest of the joint; a short, bi-articulate flagellum articulating with the anterior surface of the base of the process, two or three auditory hairs on each articulus. Inferior antennæ when folded reaching as far forward as the base of the superior pair, the distal extremity of the first joint clubbed, the first three joints equal in length, the fourth somewhat shorter, fifth very short, with one or two hairs at the apex. Mandibular appendage as long as the first joint of the inferior antennæ, the second and third joints short.

First and second pairs of thoracic legs short, chelate; the first smaller than the second, with the fourth joint broad, and produced anteriorly, the produced portion triangular, spinous, the apex long, slender, acute; the fifth joint broad, spinous below and anteriorly; dactylus nearly one-half the length of the fifth joint, curved, with a spine on the inferior edge behind the middle. The second pair of legs similar to the first; the third and fourth pairs simple, slender, shorter than the fifth; the fifth, sixth, and seventh with the first joint dilated; the basal joint of the sixth broader than the fifth, but with the remaining joints shorter, and closely pectinated along their anterior margin; the pectinations on the third joint coarse, on the fourth very fine, while those on the fifth joint are intermediate between the two preceding; the last pair of legs diminutive, not half as long as the basal joint of the preceding. The first three segments of the abdomen subequal, inferior margins finely serrated, the third segment with the postero-inferior angle produced into a long, spinous process, the angle of the first and second segments square behind, not produced; the peduncles of swimming feet broadly oval. Sixth abdominal segment and telson elongated. The first pair of caudal appendages longer and broader than the second, and reaching nearly as far backward as the last pair; the latter short; all of them biramous, and serrated along their inner margins. Telson extending beyond the extremity of the last pair of caudal appendages.

No. exam.	Localities.	Temp. water.	Temp. air.	Length.	Sex.
1	Lat. 21° 37' N. Long. 152° 28' W.	74° F.	71° F.	11 mm.	♂
2	" 29 00 N. " 157 00 W.	.....	.....	13 "	♂
3	" 25 13 N. " 143 15 W.	.....	.....	11 "	♂
4	" 15 38 N. " 118 00 W.	76° F.	.....	9 "	♂
5	" 16 25 N. " 118 00 W.	75 "	.....	8 "	♂
6	" 2 57 S. " 81 40 W.	68 "	73° F.	9 "	♂

Female.—Animal smaller and slenderer than the male. Head oblong, convex above and below, tapering in front and behind, not abruptly constricted at the neck, as is the case in the male; rostrum relatively longer, being equal to the length of the head behind it. Superior antennæ slender, straight, not produced at the apex. The thorax increases in thickness towards the middle. The peduncles of the swimming feet oblong.

CALAMORHYNCHUS. n. gen.

Body elongated, slender, almost rod-like. Head large, depressed, produced anteriorly to the eyes in a broadly-expanded, triangular rostrum; constricted behind the eyes into a short, narrow neck. Superior antennæ with the peduncle three-jointed; in the female straight. First and second pairs of thoracic legs small, chelate; the fourth joint broad and long, the fifth short and narrow. The last three pairs of legs with the basal joint narrowly dilated; the seventh pair diminutive. The sixth segment of the abdomen long and narrow. Caudal appendages long and linear. Telson short, triangular.

Calamorhynchus pellucidus, n. sp. Fig. 5, 5a.

Female.—Head long, nearly one-third of the total length, its breadth twice that of the thorax; neck short, and slightly narrower than the thorax; the portion containing the eyes oblong, convex above and below when viewed in profile, elevated above, in the median line, into a sharp ridge, which terminates at the apex of the rostrum, below the eyes from two long and rounded lobes separated by a broad, shallow groove; rostrum flattened, posteriorly broader than the eyes, commencing on either side of the eyes in a broad, rounded wing-like expansion, and tapering forward to a long and acute apex. Superior antennæ situated about the centre of the under surface of the rostrum, small and slender,

with the first and last joints of the peduncle subequal, the middle joint short, auditory hairs at the apex; flagellum bi-articulate, bent forward at its articulation with the peduncle. Segments of the thorax subequal. First pair of thoracic legs shorter than the second; the fourth joint broad, produced, and rounded anteriorly, so that the apex points upward slightly, spinous and serrated, apex acute, short; fifth joint slender, spinous, serrated on inferior edge; dactylus long, slender, acute; the hand of the second pair oblong in shape, fourth joint more elongate than that of the first pair, convex below, apex prolonged, slender, spinous, sharply serrated on anterior edge, fifth joint slender, as long as the anterior margin of the fourth joint, spinous, sharply serrated below. Third and fourth pairs of legs simple; the last three pairs with the basal joint narrowly dilated, lanceolate; the fifth pair the longest; the sixth shorter than the fifth, with the third, fourth, and fifth joints minutely serrated along their anterior margin; the seventh pair diminutive, barely exceeding the basal joint of the preceding pair. The anterior three abdominal segments subequal, the postero-inferior angle acute, projecting. The sixth segment long and narrow, slightly longer than the peduncle of the first pair of caudal appendages. First and second pairs of caudal appendages long and linear, the first stouter than the second, equal in length, falling short of the apex of the telson and the extremity of the last pair, inner margin and rami serrated; the last pair short, about one-third the length of the first pair, slightly shorter than the telson. Telson narrow, acute at apex.

Length, 12 mm. Locality, lat. $28^{\circ} 06' N.$; long. $140^{\circ} 12' W.$ Temp. water, 70° ; temp. air, 69° . Sex, female.

RHABDOSOMA, White.

Animal exceedingly elongated and attenuated, rod-like. Head produced anteriorly to the superior antennæ in a very long and thread-like rostrum; neck long and slender. Superior antennæ situated in front of the eyes, three-jointed, curved in the male, and straight and slender in the female; inferior antennæ long and five-jointed. First and second pairs of thoracic legs small and chelately developed; the fifth and sixth pairs either similar to the preceding, or with the basal joint very slightly enlarged; the seventh pair obsolete. The posterior abdominal segments, and caudal appendages very long and slender.

Rhabdosoma whitei, Bate. Fig. 6, 6a, 6b.

Rhabdosoma whitei, C. Spence Bate. Catalog. Amphi. Crustacea, 1862, p. 345, pl. 54, fig. 7.

Male.—Length of the head nearly one-half of the total length ($\frac{5}{11}$); rostrum, from the situation of the superior antennæ, three times as long as the rest of the head; the portion containing the eyes shorter than the neck, the superior surface, posteriorly, sloping backward with a gentle incline to the neck; inferior surface straight, anteriorly ascending obliquely to the insertion of the superior antennæ; the neck narrowest about the middle, enlarged at its articulation with the thorax, superiorly very slightly concave, inferior surface straight, on a level with the under surface of the eyes, a narrow and shallow groove running the whole length of the under surface. Superior antennæ with the peduncle stout, sickle-shaped, first and second joints short, third long, broad, curved, with the concavity forward, anterior apex produced into a stout process, hairy; flagellum short. Inferior antennæ long, joints subequal, except the last, in adult individuals when folded longer than the neck, reaching nearly to the middle of the eye-portion. Mandibular palpus as long as the first joint of inferior antennæ, first joint long, last two short. The third, fourth, fifth, and sixth thoracic segments subequal and lengthened, the first, second, and seventh short, the latter about one-half the length of the sixth. First pair of thoracic legs with the fourth joint short, dilated, produced anteriorly to near the apex of the fifth joint; fifth joint stout, inferior edge anteriorly dilated and slightly produced; dactylus long, slender, curved; the second pair of legs longer than the first, fourth joint slender, but slightly enlarged, produced anteriorly in a long, slender, curved process, acute at the apex, and extending slightly beyond the apex of the fifth joint; the latter produced anteriorly at its inferior angle into a short process, toothed, distal extremity of the joint enlarged; dactylus long, curved. The remaining thoracic legs simple, first joint not dilated, as slender as the preceding, increasing in length to the sixth, the third and fourth joints of the sixth pair finely toothed on the anterior margin, the fifth joint coarsely toothed; the seventh pair obsolete. The anterior three abdominal segments subequal, the postero-inferior angle produced into a prominent, acute spine, with a broad, shallow notch in front of each spine, last spine longest; the fourth segment as long as the third, and about three-

fourths the length of the sixth, slender. Caudal appendages long, linear, serrated, biramous, rami short; the first pair reaching backward to about middle of the length of the last pair; the second pair slightly longer than the sixth abdominal segment; the last pair falling short of the extremity of the telson, and shorter than the first pair. Telson cylindrical, tapering to the extremity, which is acute, and slightly defined.

No. exam.	Localities.	Temp. water.	Temp. air.	Length	Sex
1	Lat. 27° 17' N. Long. 111° 19' W.	70° F.	72° F.	*45 mm.	♂
2	" " " " " "	" "	" "	*39 "	♀
3	" " " " " "	" "	" "	55 "	♀
4	" " " " " "	" "	" "	*42 "	♀
5	" " " " " "	" "	" "	*32 "	♀
6	" " " " " "	" "	" "	*48 "	♀
7	Lat. 16° 25' N. Long. 118° 00' W.	.....	.....	*25 "	♂

Those marked with asterisks had more or less of the point of the rostrum broken off.

In the female the thorax is larger, the superior antennæ are small, slender, and straight. The last joint of the peduncle is broad and flattened at the apex, and crowned by a number of hairs. In other respects similar to the male.

The drawing was taken from a female, for the reason that it was the only one of the collection that possessed the rostrum entire.

Rhabdosoma armatum (Edw.), Adams and White. Fig. 7, 7a, 7b.

Oxycephalus armatum, M. Edwards, Hist. des Crust., iii, 1840, p. 101.

Rhabdosoma armatum, Adams and White, Voyage of the Samarang, 1850, Zoology. Crust., p. 63, pl. 13, fig. 7 (non *R. armatum*, Bate, Catalog. Amphi. Crust., 1862, p. 344, pl. 54, fig. 6.).

Young Male.—Animal robust. Rostrum broken off 4 mm. from the superior antennæ, spinulose; the portion containing the eyes oblong, deeper posteriorly than anteriorly, shorter than the portion posterior to it; the latter spinulose. Antennæ immature.¹ The superior pair stout, slightly curved, first and second joints short, subequal, the third joint long and broad, with the extremity

¹ The antennæ and mandibular palpi are in the same condition as in the immature males of *R. whitei*, where the superior pair becomes curved, and the inferior pair elongates with age, or at maturity.

crowned with hairs. Inferior antennæ and mandibular palpi short. Thoracic segments gradually increasing in length to the seventh, which is about two-thirds the length of the sixth; epimerals long, with the inferior margins finely serrated; the last epimeral contracted in the middle, somewhat dumb-bell shaped. First pair of thoracic legs short, the fourth joint produced anteriorly beyond the extremity of the fifth joint, the process slender, apex acute, inferior margin straight; fifth joint produced antero-inferiorly into a short, broad, triangular process, dactylus long; second pair slender, longer than the first pair, fourth joint produced anteriorly into a very long, slender, curved process extending beyond the extremity of the fifth joint; the latter joint longer, but produced as in the first pair, dactylus long, slender. The third and fourth pairs of thoracic legs shorter than the fifth and sixth pairs, subequal, the fourth somewhat the longer; the fifth longer than the sixth, the first joint of both somewhat enlarged, the anterior margin of the third, fourth, and fifth joints of the sixth pair finely serrated. The anterior three abdominal segments subequal, the posterior and inferior margins of the first meeting at an obtuse angle, not produced; the margins of the second segment meeting at nearly a right angle, slightly projecting; the angle of the third segment still more projecting, the margins meeting at an acute angle; finely serrulated. The sixth segment (fifth and sixth fused) nearly twice as long as the fourth, and the latter about two-thirds the length of the third; the slender posterior abdominal segments and telson spinulose. The first pair of caudal appendages reaching not quite to the middle of the last pair; the latter longer than the former, and extending quite or nearly to the extremity of the telson; the second pair slender, and of the same length as the sixth segment of the abdomen; rami long, lanceolate, margins of peduncles and rami serrated. Telson cylindrical, gradually tapering posteriorly, apex acute.

Length, from end of broken rostrum, 45 mm. Locality, lat. $27^{\circ} 17' N.$, long. $111^{\circ} 19' W.$ Temp. water, $70^{\circ} F.$ Temp. air, $72^{\circ} F.$

White named his species on the authority of Milne Edwards, that it was the same as his *Oxycephalus armatum*. I have identified the present specimen with White's figure; they agree in every essential particular. What *R. armatum*, Bate (= *Macrocephalus longirostris*, Bate, Ann. and Mag. Nat. Hist., 3d ser, i,

1856, p. 362) is, I do not know, although both the description and figure are supposed to have been taken from the same specimen that furnished White's figure; namely, the Sir E. Belcher specimen, which was captured during the cruise of the Samarang, and which is the only specimen Mr. Bate claims to have had access to. For some unexplained reason he omits all reference to White's figure, although he refers to the latter's text. Concerning the Belcher specimen, Adams and White say, "We regret that the state of the only specimen in the British Museum is such that we cannot give the generic character with that detail which we should wish." They also state that the drawing was made at the time of capture. The following characters will denote the difference between *R. armatum*, Bate, and the present species: The presence in the former of a tooth on the inferior margin of the fourth joint of the first pair of thoracic feet; of a postero-dorsal spine on the second and third abdominal segments; the non-enlargement of the first joint of the fifth and sixth pairs of thoracic legs (White's figure shows these to be enlarged); and in the relative lengths of the first and last pairs of caudal appendages, the first being longer than the last, and reaching as far backward. I give it provisionally the name *Rhabdosoma longirostris* (Bate). There are other points of difference, but the above are sufficient for the present.

EXPLANATION OF PLATES.

Fig. 1. *Oxycephalus tuberculatus*, Bate; 1a, 1b. First and second thoracic feet.

Fig. 2. *Oxycephalus bulbosus*, Streets; 2a, 2b. First and second thoracic feet.

Fig. 3. *Oxycephalus scleroticus*, Streets; 3a, 3b. First and second thoracic feet; 3c. Head of female.

Fig. 4. *Leptocotis spinifera*, Streets; 4a. Second thoracic foot; 4b. Head of female.

Fig. 5. Head of *Calamorrhynchus pellucidus*, Streets; 5a. Second thoracic foot.

Fig. 6. *Rhabdosoma whitei*, Bate; 6a, 6b. First and second thoracic feet.

Fig. 7. *Rhabdosoma armatum*, (Edw.) White; 7a, 7b. First and second thoracic feet.